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09/703,064	10/31/2000	Thomas C. McDermott III	59182-P014US-10021643	1259

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EXAMINER	
TON, ANTHONY T	

ART UNIT	PAPER NUMBER
2661	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/703,064	MCDERMOTT ET AL.	
	Examiner	Art Unit	
	Anthony T Ton	2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 October 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-67* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34, 37-39, 41-54, 57-65, and 67* is/are rejected.

7)☒ Claim(s) *35,36,40,55,56 and 66* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 October 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ ~~Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)~~ Paper No(s)/Mail Date 2.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ ~~Notice of Informal Patent Application (PTO-152)~~
6) ☐ Other: _____.

Claim Objections

1. **Claims 1** and **17** are objected to because of the following informalities:

Term "**switch**" in lines 8 and 9 is not appropriate since the "switch" should be in plural to support for "said first and said second crossbar switches". Examiner suggests changing this term to "**switches**".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. **Claims 1, 2, 10, 11, 13, 14, 16, 32, 37, 38, 50, 52, 53, 57-64** and **67** are rejected under 35 U.S.C. 102(e) as being anticipated by Ramaswami et al. (US Patent No. 6,597,826).

a) **Regarding to Claim 1**: Ramaswami et al. (Ramaswami) disclosed a communication network comprising:

two duplicated substantially identical switch fabrics, including a first switch fabric comprising a first N x M crossbar switch and a second switch fabric comprising a substantially identical second N x M crossbar switch, wherein N is the number of ingress ports and M is the number of egress ports of each respective N x M crossbar switch [*see Fig.14, 980 and 985; 900 and 955; and see Fig.19 (N:N)]* ;

wherein said first and second crossbar switches are connected in substantially identical parallel data paths, such that each ingress port of said first and said second crossbar switch is interconnected with a data launching module, and each egress port of said first and said second crossbar switch is interconnected with a data receiving module [*see Fig.14, 925 and 930 (identical parallel data paths); 900 (data launching module) and 955 (data receiving module)*]; *and*

wherein the geometry of said switch fabrics is folded, such that a data launching module and a data receiving module occupy the same physical circuit card [*see Fig.6 and Fig.8, in which, both input module and output module (I/O Port i) can occupy the same physical circuit card 215s*].

b) **Regarding to Claim 2**: The communication network of claim 1 wherein N is equal to M (*see Fig.16 input ports 1101A to 1101N, and output ports 1102A to 1102M; in this case, each I/O port module has one input port corresponding to one output port; therefore, N=M*)

c) **Regarding to Claim 10:** The communication network of claim 1 wherein said crossbar switches are optical switches (*see Fig.7, optical switch cores 240 and 260)*

d) **Regarding to Claim 11:** The communication network of claim 10 wherein said optical switches are interconnected with said data launching and said data receiving modules through optical fibers (*see Fig.6, 420)*

e) **Regarding to Claim 13**: The communication network of claim 1 wherein said data launching module and said data receiving module are internal optics modules *(see Fig.16, 1104A and 1104B; and see col.6 line 20, internal optical interface 425).*

f) **Regarding to Claim 14**: The communication network of claim 1 wherein said data launching module is interconnected with an ingress data forwarding module, and said data receiving module is interconnected with an egress data forwarding module (*see Fig.8, Tap couplers 630*).

g) **Regarding to Claim 16**: The communication network of claim 1 further comprising a router system (*see col.25 lines 34-50, optical router).*

h) **Regarding to Claim 32**: Ramaswami disclosed a method of switch fabric protection comprising:

simultaneously launching parallel duplicate data streams through two duplicated substantially identical switch fabrics, including launching a first data stream through a first switch fabric comprising a first N x M crossbar switch, and launching a substantially identical second data stream through a second switch fabric comprising a substantially identical second N x M crossbar switch, wherein N is the number of ingress ports and M is the number of egress ports of each respective N x M crossbar switch [*see col.6 lines*

31-32, both first and second, and see Fig.12, 240 and 260; 215s and 215d; and see Fig.19 (N:N)];

receiving said parallel duplicate data streams after passing simultaneously through said first and said second switch fabric (*see Fig. 12, 215d; and see col.11 lines 53-60, a destination I/O port module 215d)*;

examining said received duplicate data streams in accordance with predetermined selection criteria (*see col.2 lines 8-12, performance monitoring of these light signals; and see col.26 lines 35-36, predetermined power level*);

if either of said duplicate data streams satisfies said criteria and the other said duplicate data stream does not satisfy said criteria, then selecting said duplicate data stream that satisfies said criteria and discarding said duplicate data stream that does not satisfy said criteria (*see col.6 lines 23-49, the second optical switch core 260 provides a redundant optical path in the event the first optical switch core 240 is not operating properly in lines 25-27, select which light signal has higher quality and outputs that signal via interface 400 in lines 40-42)*; and

if both of said duplicate data streams satisfy said criteria (*see col.17 lines 19-21, the same data and protocol as expected*), then arbitrarily selecting one of said duplicate data streams and arbitrarily discarding the non-selected duplicate data stream [*see col.17 lines 19-34, behavior is very beneficial to bridge and roll applications and those that have Forward-Error-Correction data ending schemes (i.e. select one of said duplicate data streams and arbitrarily discarding the non-selected duplicate data stream)].*

j) **Regarding to Claim 37**: The method of claim 32 wherein data delivery by said data streams is not interrupted by an occurrence selected from the group consisting of malfunction, failure, removal, and replacement of one of said two duplicated substantially identical switch fabrics (*see Fig.24, in which, switch 1950 is faulty; this switch can be isolated from the system without any interruption of the delivered data since data is delivered to output module by the switch 1955).*

k) **Regarding to Claim 38**: The method of claim 32 wherein said examining is performed at an egress internal optics module (*see Fig.16, 1118A and 1118B)* interconnected with an egress port of each of said duplicated substantially identical switch fabrics (*see Fig.16, 1128A and 1128B).*

l) **Regarding to Claim 50:** The method of claim 32 wherein said crossbar switches are optical switches (*see Fig.7, optical switch cores 240 and 260).*

m) **Regarding to Claim 52**: The method of claim 32 wherein said first and said second switch fabric are incorporated into a router system (*see col.25 lines 34-50, optical router).*

n) **Regarding to Claim 53**: The method of claim 38 wherein said egress internal optics module is interconnected with said egress port through an optical fiber (*see Fig.6, 420).*

p) **Regarding to Claim 57**: Ramaswami disclosed a method of fault isolation and diagnostics in a switch fabric comprising:

launching a non-traffic-bearing data structure on a predetermined data path through said switch fabric from a first module interconnected with said switch fabric (*see*

col.23 line 66 to col.24 line 14, inserting a known byte, information is read and discovered in col.24 line11);

detecting and receiving said non-traffic-bearing data structure at a predetermined second module interconnected with said switch fabric (*see col.24 lines 8-10, discover identifier information)*;

examining said received non-traffic-bearing data structure in accordance with predetermined criteria (*see col.23 line 63 to col.24 line 2, an identifier, a known byte)*;

if said non-traffic-bearing data structure satisfies said criteria, then determining that said predetermined data path is error-free (*see Fig.23, in this case, none of switches fails – error free)*; and

if said non-traffic-bearing data structure fails to satisfy said criteria, then determining that said predetermined data path is faulty (*see Fig.24, in this case, one of the switches fails – data path is faulty)*.

q) **Regarding to Claim 58**: The method of claim 57 wherein said switch fabric comprises multiple duplicated switch fabrics (*see Fig.6, 240 and 260)*.

r) **Regarding to Claim 59**: The method of claim 57 wherein said first module is selected from the group consisting of optical switch modules and internal optics modules (*see Fig.16, 1118A and 1118B);*

s) **Regarding to Claim 60**: The method of claim 57 wherein said second module is selected from the group consisting of optical switch modules and internal optics modules (*see Fig.16, 1128A and 1128B)*.

t) **Regarding to Claim 61**: The method of claim 57 wherein said first module and said second module are the same module (*see Fig.16, 1104A and 1104A' located inside the module 1000*).

u) **Regarding to Claim 62**: The method of claim 57 wherein said predetermined criteria comprise forward error correction (*see col.17 lines 24-26);*

v) **Regarding to Claim 63**: The method of claim 57 wherein said switch fabric comprises an optical crossbar switch *(see col.24 lines 21-26, Optical Cross-connect Switching).*

x) **Regarding to Claim 64**: The method of claim 57 wherein said predetermined data path comprises an optical fiber cable *(see Fig.6, 420; and see col.4 lines 9-13, cable).*

y) **Regarding to Claim 67:** The method of claim 57 wherein said switch fabric, said first module, and said second module are incorporated within a router system (*see col.25 lines 34-50, optical router).*

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 3-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramaswami et al. (US Patent No. 6,597,826).

Ramaswami did not explicitly disclose the subject matters of two identical N x M crossbar switches, wherein N is not equal to M as recited in **claim 3**; wherein N is greater than 10 as recited in **claim 4**; wherein N is greater than 40 as recited in **claim 5**; wherein N is greater than 60 as recited in **claim 6**; wherein N and M are each greater than 10 as recited in **claim 7**; wherein N and M are each greater than 40 as recited in **claim 8**; and wherein N and M are each greater than 60 as recited in **claim 9**.

However, Ramaswami clearly disclosed two identical N x N switches, each has N inputs and N outputs (*see Figs.19; and see Fig.16 input ports 1101A to 1101N, and output ports 1102A to 1102M*). Therefore, it would have been obvious to one of ordinary skilled in the art to provide such subject matters throughout the N x N configuration of Ramaswami as taught by the applicant because N not only is an integer, but it can be any number depending on a design choice of such input and output ports, the motivation being to make Ramaswami more capable.

7. **Claims 12** and **51** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramaswami et al. (US Patent No. 6,597,826) in view of Cloonan et al. (US 5,724,352).

Ramaswami disclosed all claimed limitations of the claims 12 and 51, except for each of the crossbar switches is configured to pass information at a data rate of approximately 12.5 gigabits per second. Cloonan et al. teach such a data rate of approximately 12.5 gigabits per second (*see* Cloonan et al. *col.2 lines 51-56).* It would have been obvious to one of ordinary skilled in the art to provide such a data rate

throughout the duplicate N x N switches of Ramaswami, as taught by Cloonan et al. so that more throughputs can be used with such a data rate, the motivation being to make Ramaswami more capable.

8. **Claims 15** and **39** are rejected under 35 U.S.C. 103(a) as being unpatentable over of Ramaswami et al. (US 6,597,826) in view of Hurtta et al. (US Patent No. 6,226,261).

Ramaswami disclosed all claimed limitations of the claims 15 and 39, except for wherein said ingress data forwarding module and said egress data forwarding module are packet forwarding modules. Hurtta disclosed such modules are packet forwarding modules (*see col.7 lines 55-67, packets, input and output ports*). Therefore, it would have been obvious to one of ordinary skilled in the art to provide such subject matters throughout I/O port modules of Ramaswami, as taught by Hurtta so that a data can be implemented by packet protocol, the motivation being to make Ramaswami more capable.

9. **Claims 17-29, 31** and **42-49** are rejected under 35 U.S.C. 103(a) as being unpatentable over of Ramaswami et al. (US 6,597,826) in view of Cloonan et al. (US 5,724,352).

a) **Regarding to Claims 17-19, 27- 29** and **31**: Ramaswami disclosed a communication network comprising:

two duplicated substantially identical switch fabrics, including a first switch fabric

comprising a first N x M optical crossbar switch and a second switch fabric comprising a substantially identical second N x M optical crossbar switch, wherein N is the number of ingress ports and M is the number of egress ports of each respective N x M crossbar switch [*see Fig.12, 240 and 260; 215s and 215d; and see Fig.19 (N:N)]*;

wherein said first and second optical crossbar switches are connected in substantially identical parallel data paths, such that each ingress port of said first and said second optical crossbar switch is interconnected with a data launching module, and each egress port of said first and said second optical crossbar switch is interconnected with a data receiving module [*see Fig.14, 925 and 930 (identical parallel data paths); 900 (data launching module) and 955 (data receiving module)*] (**Claim 17**);

wherein the geometry of said switch fabrics is folded, such that a data launching module and a data receiving module occupy the same physical circuit card [*see Fig.6 and Fig.8, in which, both input module and output module (I/O port module 215s) can occupy the same physical circuit card*] (**Claim 18**);

wherein N is equal to M *(see Fig.19, N:N)* (**Claim 19**);

wherein said optical crossbar switches are interconnected with said data launching modules and said data receiving modules through optical fibers *(see Fig.8, 430 and 440)* (**Claim 27**);

wherein said data launching module and said data receiving module are internal optics modules *(see Fig.6, 425; and see col.6 line 20, internal optical interface 425)* (**Claim 28**);

wherein said data launching module is interconnected with an ingress data forwarding module, and said data receiving module is interconnected with an egress data forwarding module (*see Fig.7, I/O port modules 215s and 215d)* (**Claim 29**); and

the communication network further comprising a router system, said router system incorporating said first and said second switch fabrics (*see col.25 lines 34-50, optical router)* (**Claim 31**).

Ramaswami failed to disclose each of the crossbar switches is configured to pass information at a data rate of approximately 12.5 gigabits per second. Cloonan et al. teach such a data rate of approximately 12.5 gigabits per second (*see* Cloonan et al. *col.2 lines 51-56).* It would have been obvious to one of ordinary skilled in the art to provide such a data rate throughout the duplicate N x N switches of Ramaswami, as taught by Cloonan et al. so that more throughputs can be used with such a data rate, the motivation being to make Ramaswami more capable.

b) **Regarding to Claims 20-26**: Both Ramaswami and Cloonan et al. did not explicitly disclose the subject matters of two identical N x M crossbar switches, wherein N is not equal to M as recited in **claim 20**; wherein N is greater than 10 as recited in **claim 21**; wherein N is greater than 40 as recited in **claim 22**; wherein N is greater than 60 as recited in **claim 23**; wherein N and M are each greater than 10 as recited in **claim 24**; wherein N and M are each greater than 40 as recited in **claim 25**; and wherein N and M are each greater than 60 as recited in **claim 26**.

However, both Ramaswami and Cloonan et al. clearly disclosed two identical N x N switches; each has N inputs and N outputs (*see* Ramaswami *Fig.19, N:N and Fig.16*,

input ports 1101A to 1101N, and output ports 1102A to 1102M; and see Cloonan et al, Fig.1, N x FN). Therefore, it would have been obvious to one of ordinary skilled in the art to provide such subject matters throughout the N x N configuration of Ramaswami or Cloonan et al. as taught by the applicant because N not only is an integer, but it can be any number depending on a design choice of such input and output ports, the motivation being to make Ramaswami and Cloonan et al. more capable.

c) **Regarding to Claims 42-49**: These claims are rejected for the same reasons as claims19-26, respectively because the method steps claimed can be practice with the communication network in the claims claims19-26.

10. **Claim 30** is rejected under 35 U.S.C. 103(a) as being unpatentable over of Ramaswami et al. (US 6,597,826) in view of Cloonan et al. (US 5,724,352) as applied to the claims 17-29, 31 and 42-49 above, and further in view of Hurtta et al. (US Patent No. 6,226,261).

Both Ramaswami and Cloonan disclosed all claimed limitations of the claim 30, except for wherein said ingress data forwarding module and said egress data forwarding module are packet forwarding modules. Hurtta disclosed such modules are packet forwarding modules (*see col.7 lines 55-67, packets, input and output ports*). Therefore, it would have been obvious to one of ordinary skilled in the art to provide such subject matters throughout I/O port modules of Ramaswami or Cloonan et al. as taught by Hurtta so that a data can be implemented by packet protocol, the motivation being to make Ramaswami and Cloonan et al. more capable.

11. **Claims 33, 34, 41, 54** and **65** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramaswami et al. (US Patent No. 6,597,826) in view of Woodward et al. (US Patent No. 6,151,318)

a) **Regarding to Claims 33** and **65**: Ramaswami disclosed all claimed limitations of the claim 33, except for the subject matters of wherein said duplicate data streams comprise duplicate sequences of data structures, wherein said data structure is selected from the group consisting of data packets and substantially fixed size data chunks. Woodward et al. disclosed such subject matters *(see Fig.1 for multiple ATM cells encapsulated in a single packet this means a substantially fixed data chunk).* Therefore, it would have been obvious to one of ordinary skilled in the art to provide such subject matters throughout the communications network of Ramaswami, as taught by Woodward et al. so that a data cannot be easily corrupted, the motivation being to make Ramaswami more efficient.

b) **Regarding to Claims 34, 41** and **54:** Ramaswami disclosed all claimed limitations of the claims 34, 41 and 54, except for wherein said data structures are encapsulated before said launching with a code selected from the group consisting of forward error correction code and cyclic redundancy code (see Ramaswami, col.17 lines 24-26, forward error correction). Woodward et al. disclosed such data structures are encapsulated *(see Fig.1 for multiple ATM cells encapsulated in a single packet).* Therefore, it would have been obvious to one of ordinary skilled in the art to provide such subject matters throughout the communications network of Ramaswami, as taught

by Woodward et al. so that a data can be protected from errors, the motivation being to make Ramaswami more efficient.

Allowable Subject Matter

12. **Claims 35, 36, 40, 55, 56** and **66** would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Anthony T Ton** whose telephone number is 703-305-8956. The examiner can normally be reached on M-F: 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas W Olms can reach on 703-305-4703. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ATT

KENNETH VANDERPUYE
PRIMARY EXAMINER